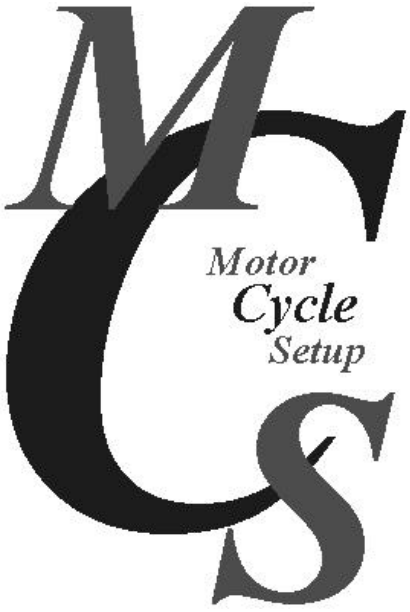

Motorcycle
Electronic Cruise Control
Installation Manual ©

For Honda VFR800

Up to 1999 (MCS1190)
From 2000 (MCS1180)

14 April, 2000

Manufactured by -
MotorCycle Setup Pty. Ltd.
7 Moritz Street, Box Hill, Victoria, AUSTRALIA, 3128

MotorCycle Setup Pty. Ltd.
Electronic Cruise Control Installation Manual ©

To suit Honda VFR800

Your electronic cruise control has been adapted from an Australian designed, automotive cruise control specifically to suit your motorcycle. Months of testing have resulted in changes to the electronic circuitry to deliver safe, reliable operation on the motorcycle models listed above. It is essential that you install the correct kit to your motorcycle and follow the installation instructions precisely so that electrical interference does not cause the unit to behave erratically or be rendered inoperative.

Your cruise control is fitted with a new 'Cruise Safe' safety cut out. If the cruise control should malfunction, either due to electrical interference or component failure, applying the brakes enough to turn the brake light on will instantly cut power to the cruise control actuator (servo). Releasing the brakes will restore power to the actuator. If the malfunction is still occurring, the only way to turn the cruise control off completely is to turn the cruise control power switch off, or the bike ignition switch. The bike 'kill' switch will stop the engine, but it will NOT turn the cruise control off. This device is fail safe in all respects except one. The brake light switches must be operative for this device to work. See the section on Safety Issues & Features for more information.

WARNING: - CHECK THAT BOTH BRAKE LIGHT SWITCHES WORK PROPERLY AND ARE ADJUSTED CORRECTLY EVERY TIME BEFORE RIDING THE MOTORCYCLE. IF EITHER SWITCH IS NOT WORKING, TURN THE CRUISE CONTROL OFF, AND DO NOT USE IT.

WE STRONGLY RECOMMEND AGAINST FITTING OFF-THE-SHELF MOTOR CAR CRUISE CONTROLS TO ANY MOTORCYCLE!

If, after reading these instructions, you feel you are not competent to install this kit, we strongly urge you to seek the assistance of one of our authorised dealers and installers. Please phone or email us to obtain the name of your nearest outlet.

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1. INTRODUCTION

Congratulations, you have purchased one of the most advanced cruise control systems in the world - and the first after-market electronic cruise control kit adapted to motorcycles. Your new cruise control has more operating features than many units costing much more. All functions are microprocessor controlled, which reduces the complexity of installation.

Before installing your cruise control, take the time to read and understand each installation step in this manual. Several steps are dependent on others, so it is important know where and how each component is to be mounted before installation commences.

Your kit has been designed for a specific motorcycle. Even if you have installed kits before, take note of where and how components should be installed - particularly the wiring harness layout and connections.

2. WARNINGS, CAUTIONS and NOTES

This manual contains several **cautions**, **warnings** and **notes,** which are prominently displayed. The convention used is:

A **warning** applies whenever injury could result from ignoring the warning;
A **caution** applies whenever damage to the bike or cruise control could result from ignoring the caution; and
A **note** applies where other aspects should be considered before any action to do with installation is undertaken.

EXAMPLES:

WARNING: **Always ensure the bike is properly supported on the side or centre stand and cannot accidentally fall off either stand.**

CAUTION: **Before drilling any holes, make sure there are no components that may be damaged on the other side of the surface being drilled. Double check for any wiring harness which might be easily damaged by a drill bit.**

NOTE: **Lay the wiring harness in place and connect the components before cable tying the harness in place.**

3. TOOLS REQUIRED

A comprehensive set of tools. The list below includes many of the items required, but does not necessarily include all items for all kits/models. It is provided for guidance only in determining whether you might be able to fit the unit yourself.

- 8mm, 10mm & 12mm sockets and spanners;
- Phillips head screwdriver;
- Flat blade screwdriver;
- Long nose pliers;
- Set of metric allen keys;
- Loctite 243 or 222;
- Flat file, grinder or sandpaper.

4. PARTS LIST

Check that all components depicted in the parts list at the rear of this manual are included in the cruise control kit. Please phone (03) 9808 2804 or 0411 457 147 within Australia, international (61 3) 9808 2804
or fax (61 3) 9808 2445 for advice, if any parts are missing;

5. OVERVIEW OF CRUISE CONTROL OPERATION

The principles behind your cruise control's operation are very simple:

- The computer continuously monitors the frequency of electrical pulses generated by the bikes speedometer sender unit;

- When the SET key on the switch is pressed the computer stores the pulse frequency at the time in memory and then continuously adjusts the vacuum actuator, which controls the carburettors to maintain the pulse frequency at the same figure to which it was set. If the frequency drops below the set frequency, the computer applies more throttle. If the frequency is above the set frequency, the computer turns the throttle off. The key is that the computer monitors and reacts to changes very quickly and smoothly so that the speed effectively remains nearly constant.

There are five major components in your kit: the computer, the vacuum actuator, the switch, the Electronic Clutch Switch (ECS) and the loom. The functions of each are described below:

- the computer - monitors road speed, adjusts the throttle by controlling the vacuum actuator, monitors the switch and brake system for instructions from these components;
- the vacuum actuator - controls the carburettors by pulling or releasing a cable which attaches to the carburettors;
- the switch - sends instructions from the rider to the computer;
- The ECS – monitors engine revs and will disengage the cruise if the revs climb due clutch disengagement; and
- the electrical loom - which connects the switch, the computer, the vacuum actuator, the speedo sender and the brake system.

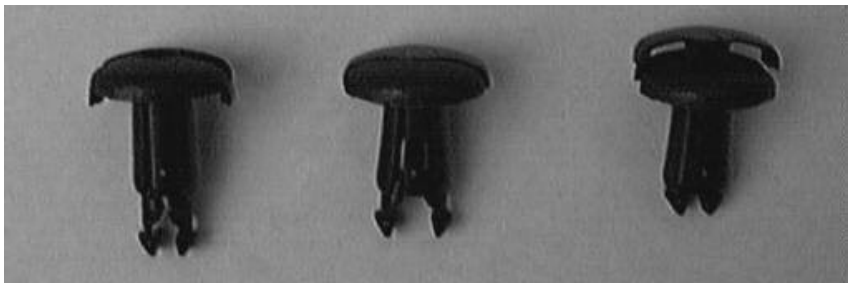
When the cruise control is operating, it is possible to roll the throttle off by hand, thus opposing the cruise control actuator. As this will result in a loss of speed the cruise control computer will ‘read’ this as the bike going up an incline, and attempt to apply more throttle. If the twist grip is released again, it is possible for the throttle to go immediately to full throttle. While the throttle will back off again as soon as the set speed is reached or if the rate of acceleration exceeds the cruise controls preset rate (1 ~ 2 km/h gain in speed per second), the initial acceleration could be quite violent. As a result, we do not recommend manually forcing the throttle off while the cruise control is engaged.

If the throttle grip is twisted open while the cruise control is engaged the cruise control is over ridden by the rider. When the throttle is released, the cruise control will resume control, unless it has been disengaged by brake operation or if the motor cycle exceeds the current set speed by 150% such as during an overtaking manoeuvre. The cruise will also disengage if the speed drops to 75% of set speed such as when riding up hill. This is unlikely to occur on large capacity motorcycles.

6. PREPARING THE BIKE FOR CRUISE CONTROL INSTALLATION

Remove the seat, fairing lowers and rear body section, etc. using the following procedure:

- Remove the seat.
- Remove the rear body section by removing the two rear grab handles, undoing the four mounting screws near the front of the rear body section and the two luggage strap bolts. Unplug the four tail light and turn signal light globe holders from the tail-light, and remove the rear body section.
- Remove the left fairing lower panel using the following method:
  - Remove the two screws securing the fairing dash surround to the lower panel.
  - Remove the three screws at the join near the front turn indicator.
  - Remove the four screws securing the lower inner panel (fill panel in front of the exhausts) to both left and right fairing lower panels.
- Some of the fairing parts are secured using a new type of plastic plug. The following shows how to remove and reinsert these plugs:
  - The photo shows the plugs in three states.
  - The left plug has the centre pushed in to allow removal of the plug from the fairing.
  - The centre plug is locked with the centre flush, as it would be when installed.



  - The right plug has the centre pushed out, and is ready for insertion.
  - Resetting the plug for reinsertion requires that the centre section be pushed out again. To do this, push your finger between the two protruding pointed tangs on the end of the plug (NOT the head) and spread the ends while pushing them towards the head of the plug.

  - The centre of the head will be about 3mm (1/8”) proud of the head when the plug is reset correctly and the only the pointed ends of the two tangs will still be protruding from the shaft of the plug. This will allow the plug to be reinserted and the centre of the head pushed in until it is flush. This locks the plug.

- Remove the two plastic plugs securing the bottom join of the left panel to the right panel by pushing the centre of the plug in and then withdrawing the plug. This may be difficult if the plug has become caked with dirt. The centre section of the plug pushes in about 1.5mm (1/16") and the plug can then be withdrawn from the hole.

    - Remove the one plastic plug securing the lower inner panel (fill panel in front of the exhausts) to the left lower panel. This is on the inner side of the fairing, just beside the front wheel near the join with the upper fairing.

    - Remove the two large screws, one at the rear edge of the panel and one at the bottom of the panel and remove the panel. The rubber 'nuts' used to hold the fairing bolts may stick to the faring panel, giving the impression that it is still bolted on. It may take some movement to unstick the rubbers to allow removal of the panel.

    - Remove the right hand fairing lower panel using the same procedure.

    - Remove the lower inner panel by removing the two plastic plugs securing it to the upper fairing at the rear edge and then release the tags securing it to the fairing inner panels at the front edge.

    - Undo the two bolts securing the front of the fuel tank. Lift the front of the tank. It may be necessary to release some of the drain hoses from their clips to allow the tank to be lifted all the way. The tank may be held up using a piece of wood about 330mm (15") long on top of the airbox.

THE FOLLOWING IS ESSENTIAL TO SAFE AND SMOOTH OPERATION OF THE CRUISE CONTROL. We have experienced a new bike that had been in storage in which the throttle cables had corroded slightly. This increased friction to the point that the throttle would not return by itself. The following measures will ensure that the cables will operate with minimum friction and will not corrode.

    - Disassemble the right hand switch block and run 6 drops of VERY light oil (sewing machine oil or similar) down each throttle cable. DO NOT USE MOTOR OIL ON THE THROTTLE CABLES. Run a few drops engine oil under the throttle hand grip on the handlebar. It may be necessary to remove the hand-grip from the handlebar in order to clean the handlebar under the throttle grip and the bore of the throttle grip. This will require that the throttle cable be disconnected from the injection throttle bodies. After cleaning apply a few drops of motor oil, or apply a VERY THIN SMEAR of grease and then a few drops of motor oil to the handlebar where the throttle grip turns on the handlebar.

    - Reassemble the right hand switch block and adjust the throttle cables so that there is 1~3mm (1/16"~1/8") free movement of the throttle grip at the rubber flange next to the switch block.

- Remove the coolant overflow bottle by undoing the left rear fairing mount bracket bolt and removing the bracket. Undo the shouldered bolt holding the top of the bottle and remove the bottle, allowing it t hang from its hoses.

7.0 INSTALLATION

7.1 Installing the Computer

- The computer is mounted in the right side of the bike below the seat and inside the rear body section. Attach it to the rear frame tubes using two 200mm cable ties as shown in the photo.

- Ensure that the sensitivity switch on the front of the computer is on the L (low) position (pushed all the way down).

7.2 Installing the Wiring Loom

- Plug the 12 pin plug on the cruise loom into the computer. Note:- The latch on the plug faces inwards.

- Run the loom forward above the electrical 'black boxes' and down to the motorcycles loom in front of the rear brake reservoir. Feed the loom inside the frame just below the rear sub-frame mounting bolt (where it bolts to the main frame).

  Note: - This photo does NOT show the 'CruiseSafe' relay on the wiring loom. The photo was taken before this safety feature was introduced.

- Feed the main section of the loom (with the actuator wires and switch plug) forward under the frame top cross brace (under the rear of the fuel tank), forward between the cylinder head and the right frame spar. This may be cable tied if desired, but if gentle pressure is used it will 'wedge' between the frame rail and the cylinder head and stay there.

- Continue feeding the loom down on the right side of the motor between the cylinders and out side the frame just above the top radiator hose. The switch plug should reach to and be visible above the radiator hose.

- Continue running the actuator wires forward and down just below the right radiator and allow the wires to hang near the front of the motor.

- Undo the earth bolt on the frame below the back of the fuel tank and place the cruise loom earth connector under this bolt with the other earth wires.)

- The speed sensor wire branches off just after the earth wires. Run the speed sensor **wire with the brake hydraulic lines up over the frame top cross brace** and over to the left side of the bike, under the rubber cover and just in front of the fuel tank rear mount. Continue down with the brake lines and then out of the frame just above the clutch slave cylinder.

- Locate the speedometer sender unit, which is attached to the drive sprocket cover just behind the clutch slave cylinder. Trace the connecting wires back to the three pin plug (just inside the frame) and disconnect the plug. Plug the matching halves on the cruise control loom into the disconnected plugs so the cruise loom bridges the speedometer sensor connectors.

- Tuck the connector back up inside the frame.

- Cable tie the cruise loom to the frame at the join of the top cross brace and the right side main frame to prevent the cruise loom dropping onto the rear cylinders exhausts.

- The cable tie wraps around the loom under the top cross brace. The photo is taken from the left side of the bike looking between the rear shock absorber and the chain guard up to the frame cross brace.

- Locate the rear brake light switch. It is operated from the rear brake pedal by a spring. Follow the wires up from the rear brake light switch to its connectors.

Note: - Bikes up 1999 use bullet connectors on the rear brake light switch. Bikes from 2000 use a three way plug with only two wires. You loom will have the appropriate connectors on it.

Up to 1999.

- Disconnect the brake switch wire bullet connectors.
- Connect the cruise loom power and brake connectors as follows:
- Plug the male bullet with the orange and black wires on the cruise loom into the female bullet connector with the black wire with the brown trace on the motorcycles loom. This connector supplies power to the cruise control.

- Plug the female bullet connector with the green wire on the cruise loom onto the male bullet connector with the green wire and yellow trace on the motorcycles loom.
- Plug the remaining plugs on the cruise control loom (black and brown wires and green and brown wires) into the two connectors from the brake switch. The black and green wires bridge the connection from the switch to the main loom, and the brown wires take off the brake signal to the cruise control.

From 2000.

- Disconnect the rear brake light switch plug. Plug in the two matching connectors on the cruise loom. This will bridge the connection and will provide power and brake light signal to the cruise control.

All models.

- Tuck the connectors out of the way near the brake reservoir.
- A cable tie is located near the rear brake reservoir. Undo this and wrap it around the cruise loom as well as the other cables.

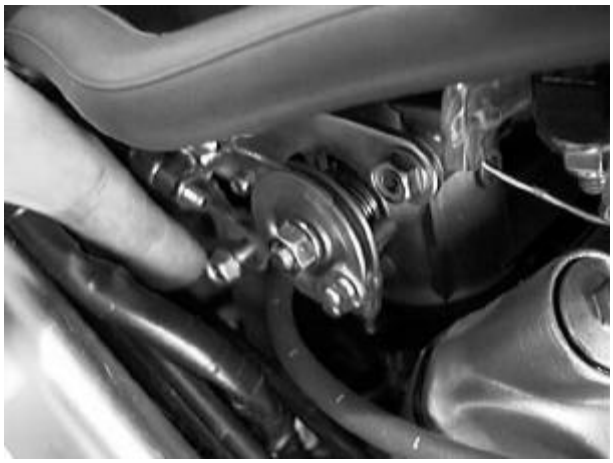
7.3 Installing the Actuator and Throttle Linkage

- Undo the four Phillip's head screws holding the top aluminium cover and bracket on the actuator and remove the cover. Note:- The three screws in the bracket are longer than the fourth screw in the cover.
- Starting at the front of the bike feed the end of the actuator cable rearward from just above the left radiator fan shroud (above and to the left of the oil cooler) rearward past the front cylinder head, above No.2 spark plug lead and below and parallel with the large loom that runs into the injection throttle bodies. Pull the cable through until the end is past the left side of the rear cylinder head, and below the crankcase breather hose. The actuator should be hanging on its cable below the left radiator.

- Remove the number one balance hose from the stub on the air box and run it to the rear above the rear cylinder head. Connect the black end of the one way valve supplied in the kit to this hose and route the new hose on the white end of the valve around the back of the crankcase breather hose above the rear cylinder head to the right side of the bike. Route the hose down the right side of the motor with the cruise wiring loom and then out with the actuator wires so that it hangs with the actuator wires near the bottom front of the motor. If necessary cable tie the hose to the bikes fuel lines or loom.

- Undo the left rear air box lid screw (there is also a wire clip for the coil wires on this screw) and place the cable tie clip under the screw. Replace the screw. **Use two cable ties** to attach the crankcase breather hose to the cable tie clip in the position shown in the photo. The hose must be raised enough to clear the throttle linkage that will be installed next. Raising the hose too far will make the fuel tank a tight fit. Apply the supplied label to the air box next to the cable ties. This is to prevent anyone removing the cable ties in the future.

- Locate the throttle spindle cable spool and undo and remove the nut on the end of the throttle spindle.



- Undo and remove the throttle-body frame bolt located just below the throttle cable adjusters.

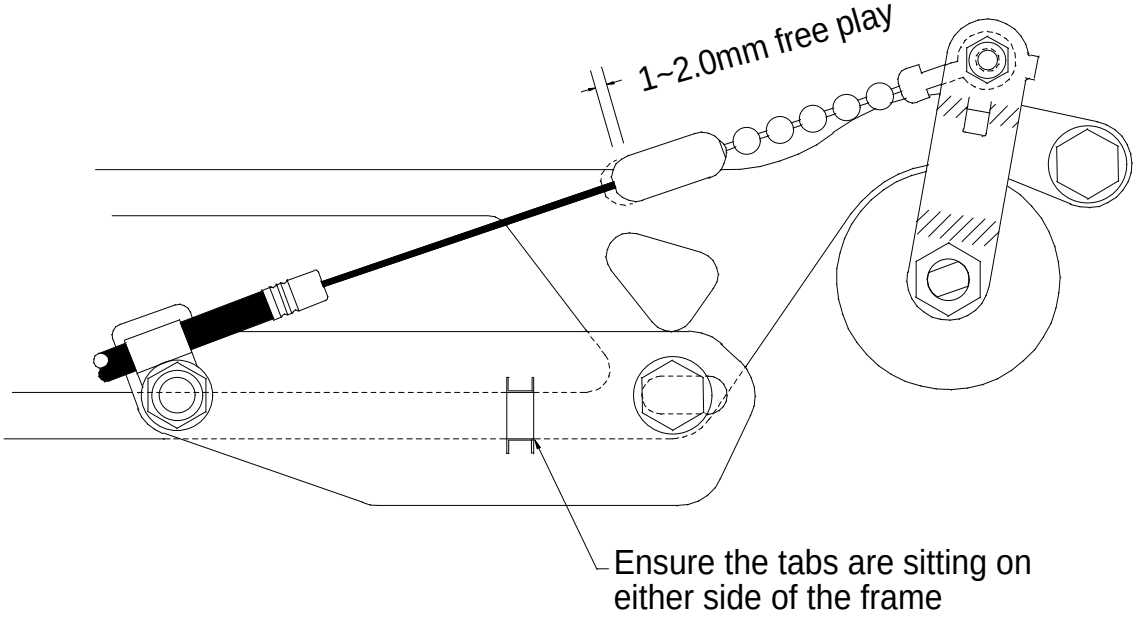
- Attach the supplied flexible cable bracket to the end of the actuator cable using a M6 x 15 bolt and two flat washers and a Nyloc nut. Place a flat washer on the bolt, then put the bolt through the flexible cable bracket. Put the flexible cable clamp on the bolt, then another flat washer and the Nyloc nut. Tighten the bolt while holding the cable and clamp in line with the end of the bracket as shown in the photo.

- Attach the carburettor arm to the end of the actuator cable eye using the 4mm shouldered screw then the end of the cable, then the 4mm flat washer. Screw this into the carburettor arm and tighten gently. Finally screw the 4mm Nyloc nut on the screw and tighten gently.

- Feed the actuator cable and bracket forward while withdrawing the actuator cable from the front of the bike until the hole in the flexible cable bracket lines up with the mounting bolt hole in the throttle bodies. Loosely install the bolt. Note the two lugs coming from the back of the flexible cable bracket. Ensure that these lugs sit either side of the lower rail on the throttle body frame to prevent the bracket rotating. The flexible cable bracket should sit on the side of the throttle body assembly pointing slightly downward towards the front of the bike (parallel with the frame on the side of the throttle bodies).

- Place the carburettor arm on the throttle spindle, apply a drop of Loctite 242 or 243 medium strength thread locker to the thread and install the spring washer and nut. Gently tighten the nut. Be very careful not to over tighten this nut as a stripped or broken throttle spindle will be VERY expensive to replace.

- Final adjustment of the actuator cable is done using the slotted hole in the flexible cable mounting bracket. The cable must have 1~2mm free play to prevent the actuator cable holding the bike above idle. This results in at least 15mm (5/8”) of sideways free movement in the cable. If the slot is not long enough to achieve the desired adjustment you will need to move the cable clamp on the cable.



- Operate the throttle to ensure that there is no interference with the cruise control mechanism. Look CAREFULLY around the throttle bodies and actuator cable to ensure that there is nothing that could interfere with the cable or carburettor arm. It may be necessary to bend the carburettor arm slightly to clear the air box. Be careful not to strain the throttle spindle when doing this. **If there is any possibility of anything fouling the throttle mechanism, move it or cable tie it out of the way.**

- Lower the fuel tank and ensure again that nothing fouls the throttle mechanism and that the tank sits in position correctly.

- **WARNING Your cruise control is designed with numerous safety features, but none of these can prevent a runaway condition caused by a tangled or jammed throttle linkage. DOUBLE CHECK IT.**

- Return to the actuator that is hanging below the left radiator.

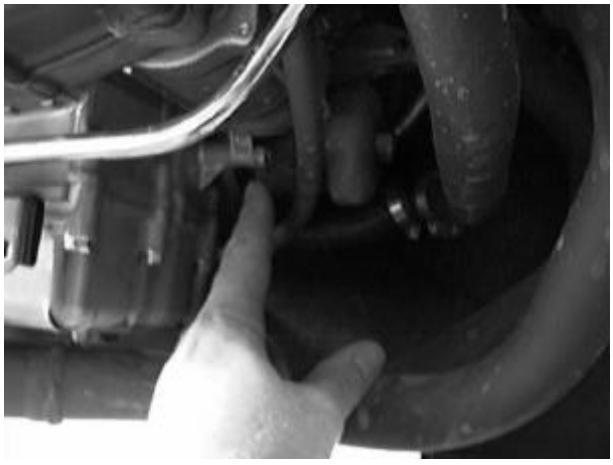
- Feed the actuator through the gap above the exhaust pipes and below the bottom radiator hoses to the left side of the bike.

- Remove the rubber grommet from the actuator top cap. Feed the actuator wires through the rubber grommet and slide the grommet up the wires. Feed the wires through the hole in the actuator cover from the outside to the inside, and connect the colour coded wires to the matching wires on the actuator.

- Position the plugs on top of the actuator and slide the cover onto the actuator. There is room between the top of the actuator and the inside of the cover for the three plugs. Locate the mounting bracket on the actuator and attach the bracket using the three longer screws. Use the fourth, shorter, screw in the spare actuator cover hole.

- Feed the vacuum hose through the grommet and push the hose onto the actuator hose barb. Slide the grommet down the hose and wire and install it in the hole in the actuator cover. This is easier if a little lubricant is used on the grommet. A few drops of water works well.

- Remove the lower starter motor mounting bolt. The starter motor is located on the front of the motor beside the oil filter.



- Position the actuator bracket over the bolt hole and re install the bolt.

- Using the M6 x 25 bolt supplied with a flat washer under the head, attach the lower mounting hole in the actuator bracket to the free mounting lug on the front of the sump. It may be necessary to bend the bracket slightly to make the holes match. Install another flat washer and then the M6 Nyloc nut and tighten. Tighten the starter motor mounting bolt.

- Ensure the actuator wires and hose are routed neatly and cannot be damaged. Cable tie in place if required.

7.4 Installing the Switch

- Place a rag on the body work under the left hand handlebar to prevent scratching.

- Loosen and remove the two bolts holding the clutch master cylinder assembly to the handlebar.

- Remove the clamp.

- Using a flat file (the most effective and easiest way) or a grinding wheel or sandpaper remove approximately 1.0mm (0.040”) (about 2/3 the thickness of the switch bracket) from the **lower** face of the clamp. This face is already lower then the top face, and it is also identified by the ‘up’ arrow on the clamp.

- Reinstall the clamp with the top bolt only. Slide the switch bracket between the lower faces of the clamp and clutch master cylinder and install and tighten the bolt. There is a punch mark on the handlebars to assist in positioning the clutch lever assembly. Line up the top gap with the punch mark and tighten the top bolt. If there is not a small gap between the top faces of the clamp and the master cylinder, ensure that the clutch lever assembly cannot rotate around the bars. If it does, remove the clamp and file some more material from the bottom face.

- Route the switch wire around the front of the head stem to the right side of the bike.

- Route the wire up with the brake hydraulic lines on the right side of the steering head, then to the rear along the right side of the frame beside the air box. Route the wire down the inside of the frame to the radiator hose and re-connect it to the cruise control loom plug (circled in the photo).

- Keep the wire near the top of the frame rail until it drops down to the cruise loom plug, as this will increase the distance from the ignition coil and spark plug leads and reduce the risk of interference.

- Connect the switch plug to the matching connector on the loom that is sitting on top of the radiator hose (circled in the photo). Cable tie the loom and switch wire to the radiator hose or the frame.

- Cable tie the wire to the brake lines at the top (circled in the photo), and elsewhere if needed.

- Cable tie the wire any where that is required to prevent damage to the wire during steering movement.

- Lower the fuel tank and position it in its proper place, and CAREFULLY turn the handlebars from lock to lock while checking that the cruise switch does not touch the fuel tank and the switch wire is not strained at all. The switch bracket may be bent if required to clear the fuel tank. Reposition the wire if required to prevent straining.

7.5 Installing the Electronic Clutch Switch (ECS)

How the ECS works.

The electronic clutch switch (ECS) is not a true switch, but is a device that monitors the rate of gain of engine speed and also the absolute speed of the engine by monitoring ignition pulses. If the switch detects a rapid increase in engine speed, such as when the clutch is disengaged while throttle is applied, the ECS will activate and disengage the cruise control. The switch does not respond to a decrease in engine RPM. For example, if the motorcycle is travelling down a hill with the cruise engaged and no throttle applied, and the clutch is disengaged by the rider, the engine speed will drop to idle. The ECS will not disengage the cruise control. When the speed of the bike drops to the set speed the cruise will apply throttle. Only when the engine speed starts to increase will the ECS detect the change, and then disengage the cruise.

The switch will detect the engine speed increase and switch off the cruise by the time the engine has gained 2,000 ~ 3,000 RPM. How high the engine revs above the initial 2,000~3,000 depends on how much throttle the cruise has applied at the time. If the throttle is open a significant amount, such as when travelling up a hill, the time taken for the throttle to return to idle position may mean the engine gains a lot of revs when the clutch is pulled in.

If the cruise has only applied a small amount of throttle the rate of change in the engine speed may be so slow that the ECS will not detect it at all. The engine may reach redline or beyond if the rate is slow enough, although this is unlikely. For this to occur the engine would have to take 5 seconds or more to go from idle to redline. On most high revving motorcycles (sports engines) the ECS should activate regardless before redline is reached as the engine speed exceeds the inbuilt limits of the ECS.

Fitting the ECS

- Locate the rear ignition coils. The coils are under the fuel tank, mounted immediately behind the air box. The top coil has a black wire with a white trace and a red wire with a blue trace going to it. Disconnect the red/blue trace wire from its coil spade terminal.

Note: - Adjusting the switch will require that the switch is removed from its mounting, so you may wish to mount the switch after testing.

- Check to see that there is sufficient length in the wires to allow the switch to mount where you want to put it. Mount the clutch switch under the right hand side of the rear body section or on the rear mudguard (fender) using the cable ties, self-adhesive pads or screws provided. The switch can be mounted elsewhere if you wish provided the wires are long enough to allow this. The most common place is to mount the switch behind the cruise control computer using cable ties (see photo), or on the mudguard (fender) just inside the frame rails using the self-adhesive pads or screws.

- The clutch switch has four wires coming out of it. Connect them as follows:

- Route the orange and purple wire with the cruise loom to the cruise control computer. Connect the plug on the wires to the matching plug on the short leads from the computer plug.

- The green earth wire with the eye connector should be placed under the same ground bolt that the cruise ground wire was connected to earlier.

- The yellow ignition sensor wire should be run with the cruise control loom forward until the large frame cross brace that is above the rear cylinder bank. Then across with the hydraulic lines under the rubber protective sheet (immediately in front of the fuel tank rear mount), then forward to the ignition coil. Run the wire to the coil terminals. Insert the male spade connector into the previously disconnected wire from the coil and slip the insulator over the connector. Connect the female terminal to the coil. Ensure the wires are routed so that the will not be chafed or damaged when the tank is replaced.

- Cable tie the ignition sensor wire to the cruise control loom in a few places. Ensure that all other wire are routed neatly and cable tied if needed.

Your cruise control is now ready for testing!

8. DIAGNOSTIC MODE OPERATION

Your cruise control comes with a means of making it operate the throttle without the speed sensor detecting movement. This is the best way to check that the electrical and mechanical operation of the cruise control is working properly - excluding speed control circuits.

Note: - During the diagnostic checks many of the features of the cruise control are confirmed by the LED (light) on the computer operating. For example, the LED confirms brake switch operation. The LED only stays on for a few seconds with most operations. If the brake pedal is pushed, the LED will come on. If the pedal is held after a few seconds the LED will go out. If the pedal is released and re-applied, the LED will come back on, and then turn off after a few seconds. THIS IS NORMAL AND DOES NOT INDICATE A FAULT IN THE SPEED CONTROL. This applies to most operations performed in diagnostic mode.

- Turn the cruise control ON/OFF switch to OFF;
- Turn the ignition switch ON but DO NOT start the engine. Check that the kill switch is also ON.
- Depress and hold the SET key <u>while turning the cruise control ON</u>;
- Take your finger off the SET key;
- Pull the front brake lever and depress the rear brake pedal a few times. The LED on the computer should illuminate when EITHER lever is used. This indicates that the cruise control will cancel when the brakes are applied. If the LED does not come on, the most likely cause is incorrect adjustment of the brake switches. If either of the switches is adjusted so that it does not turn OFF at all, the light WILL NOT COME ON AT ALL. It is then necessary to adjust the switch so that it turns OFF when the brake is released. IF THE LED OPERATING ON THE COMPUTER DOES NOT CONFIRM THE BRAKE SWITCH OPERATION NOTHING ELSE WILL WORK ON THE CRUISE CONTROL. See the next section.

- Now tap the SET key once while listening for a click from the vacuum actuator and watching the red LED on the front of the computer. You should hear the click and see the LED flash. Depress and hold the SET key. The LED should come on a stay on while the SET key is depressed and regular clicks should be heard from the actuator.
- Now tap the RES key once while listening for a click from the vacuum actuator and watching the red LED on the front of the computer. You should hear a slightly different sounding click and see the LED flash. Depress and hold the RES key. The LED should come on a stay on while the RES key is depressed and regular clicks should be heard from the actuator.
- Turn the cruise control power switch OFF;
- Start the bike in neutral;
- Depress and hold the SET key <u>while turning the cruise control ON</u>;
- Take your finger off the SET key;
- Now tap the set key once while listening for a click from the vacuum actuator and watching the red LED on the front of the computer. If you hear the click and see the LED flash, tap the SET key a few more times until the revs start to rise. Depress the RES key and the revs will drop. Some delay occurs with these operations.

CAUTION: You need to be careful not to tap the SET key too many times as it is easy to over-rev the engine if you tap it too often. If the engine revs too fast quickly turn off the cruise control switch OR the bike's KILL switch. If the ECS (electronic clutch switch) is working correctly it should protect the engine by shutting off the cruise control before such high revolutions are reached;
CAUTION: IT IS <u>VERY</u> EASY TO OVER-REV THE BIKE IN THE NEXT STEP - SO BE CAREFUL!

- When you are sure single taps work, depress and hold the SET key for a couple of seconds and see if multiple pulses are sent to the actuator. Listen for clicks and look at the LED.

Checking the speed sensor: With the cruise in diagnostic mode, put the bike on the centre stand with the engine running, engage 4th or 5th gear and carefully accelerate the engine until the rear wheel is spinning at 60 or 70 kph (45+ mph). Observe the LED on the computer to see it flashes regularly. It should flash quite slowly at these speeds - at 1-2 second intervals.

Checking the ECS: With the cruise in diagnostic mode with the engine running, observe the red LED indicator on the clutch switch and the LED on the computer. Quickly rev the engine by 'blipping' the throttle. The LED's should illuminate briefly as the engine reaches 2,000~3,000 RPM if the engine starts from idle.

The slower the rate of increase of revs, the higher the revs required to make the LED light. A quick blip should resulting in the LED coming on at about 2,000~2,500 RPM. A slow increase in revs may not see the LED coming on until 4,000 RPM or more. When the LED's come on it indicates that the cruise control will be cancelled.

Using the bikes throttle raise the engine speed to the same revs that would be used at typical 'cruising speed' ie about 100kph (60mph), typically 3500~4000 RPM. The LED on the ECS should come on. Hold the engine speed constant. The LED should turn off after 5~20 seconds.

If the LED does not turn off after 30 seconds, the cruise control may not work and the sensitivity of the switch may need to be adjusted. The adjustment procedure is described in Section 12, Road Test and Adjustments.

NOTE: Remember to wait at least 5 seconds after turning the cruise control off when in diagnostic mode to then use it in cruise control mode – otherwise it stays in diagnostic mode. It takes time for the capacitor that protects the computer from surges in the power supply to discharge fully.

After testing reassemble fairing panels and body sections.

- When the left-hand lower fairing panel is installed, the actuator cable location is important. There are two tags on the left lower fairing panel that are used to attach this panel to the lower inner panel (fill panel in front of the exhausts) using two screws. The cable must run IN FRONT of the TOP tag so that the cable is secured in place when the mounting screw is installed.

- The cable will come out of the cavity in the fairing next to the left hand radiator as shown in the photo.

9. MANUAL ADJUSTMENTS TO THE BRAKE PEDAL AND FRONT BRAKE LEVER

Since the brakes are the fastest way to turn the cruise control off, it is ESSENTIAL that they be adjusted optimally to suit the rider AND that they activate the rear brake lamp as quickly as possible. It is recommended that both front and rear brakes be set up so that the brake lamp turns on as early as possible when either brake is applied. Naturally you have to ensure that the brake lamp does turn off - otherwise the cruise control will not work at all. Careful adjustment of the foot brake lever so that the rider's foot does not have to lift up to reach it is recommended. Next, adjust the brake switch so that it turns on with very little movement of the brake pedal. Repeat this process with the front brake lever.

It is recommended you adjust the rest position of the **gear lever** to the foot brake lever for optimum rider comfort.

NOTE: IF THE REAR BRAKE LIGHT FILAMENT OR FUSE BREAKS, OR THE BRAKE LIGHT IS ON, THE CRUISE CONTROL WILL NOT WORK AT ALL. IF YOUR CRUISE CONTROL APPEARS NOT TO BE WORKING, THESE ARE THE FIRST THINGS TO CHECK.

10. OPERATING INSTRUCTIONS

Although your cruise control has many operating features, it has been designed to be very easy to operate. Its operating range is from about 40kph (not recommended) to approximately 180kph (also NOT recommended).

The cruise control operates by monitoring the road speed of the bike and uses a computer to maintain any ‘set’ speed within its operating range. The computer is instantly de-activated by either front or rear brake lever pressure sufficient to turn on the brake lights.

All commands are input using the three switches on the switch block.

The functions performed by each key are as follows:

ON/OFF Switch

The OFF-ON switch is a slide switch and 'enables' the SET/ACC (Set/Accelerate) and RES/DEC (Resume/Decelerate) keys when turned ON. The SET/ACC and RES/ACC switches are activated by depressing them. Turning the OFF-ON switch OFF disables the cruise control.

SET key - maintains bike speed or produces acceleration

The SET key has four functions:

1. When the bike is in motion within the cruise control's operating range, depressing and releasing the SET key sets the computer to maintain the speed at the time the SET key was depressed;

2. While the cruise control is controlling the bike's speed, firmly but quickly tapping the SET key increases the set speed by about 2kph for each tap. Six (6) taps in rapid succession increases the set speed by approximately 10kph. Different bikes respond slightly differently. Experiment until you find out precisely how your bike responds;

3. While the cruise control is controlling the bike's speed, depressing and holding the SET key results in the bike smoothly accelerating until the SET key is released (or until the bike achieves the cruise control's maximum operating speed - this is not recommended). The rate at which acceleration takes place is a function of the power of the bike and the position of the sensitivity switch [Refer to section 10] on the cruise computer;

4. Used in conjunction with the ON/OFF switch, it puts the cruise control in 'diagnostic mode'.

While riding the bike, the cruise control can be set to a higher speed by:

a. Opening the throttle and pressing the 'SET' key after the required speed is reached;

b. Tapping the 'SET' key to progressively accelerate the bike;

c. Depressing and holding the 'SET' key until the required speed is reached.

RES key - resumes the bikes previously set speed or decelerates the bike.

1. If the cruise control has been controlling the bike's speed and has been deactivated using the brakes AND the cruise control or engine have not been turned off, depressing and releasing the RES key causes the cruise control to return to its previously set speed;

2. If the cruise control **is controlling** the bike's speed, tapping the RES key decelerates the bike by approximately 2kph per tap;

3. If the cruise control **is controlling** the bike's speed, depressing and holding the RES key down, decelerates the bike until it is released or the bike slows beyond the cruise control's operating range. Releasing the key sets the computer to the current speed.

NOTE: 1. If the bike's speed drops below 75% of the SET speed, the cruise control deactivates by itself. This could happen on a very steep incline, but is very uncommon on large capacity bikes. If it does, simply accelerate using the throttle and SET the cruise control again.

2. If the bike's speed increases to 150% of the SET speed, the cruise control deactivates by itself. This can happen when accelerating to pass a car. If it does, simply decelerate using the throttle and SET the cruise control again.

11. SAFETY ISSUES & FEATURES

Electrical 'Noise'.

Noise is a broad term used to describe the electromagnetic radiation of energy. Noise is generated during rapid changes in voltage or current levels or by radio transmitters (ignition systems, alternators, mobile phones and other heavy current carrying wires). If noise gets coupled into the cruise control wiring harness it can create disturbances within the cruise control computer. The cruise control may drop out after engagement or not engage at all, but still pass all diagnostic tests.

The most likely causes of electrical noise interference on a motorcycle is faulty spark plug leads or fitment of non suppressed spark plug leads, or the electrical system could be in poor repair due to age or lack of appropriate preventative maintenance.

WARNING: - It is ESSENTIAL that the spark plug leads are radio suppression type leads and that they are in good condition. Inspect the spark plug leads for any cracks, and replace if required. All original equipment high-tension ignition leads, in optimal condition, should be acceptable, but the cruise control MUST NOT BE USED IF AFTERMARKET SOLID CORE HIGH TENSION LEADS ARE FITTED.

Ideally all cruise control wiring should be kept as far as possible from all high voltage and high current wiring. This is often difficult to achieve on a motorcycle due to space limitations, so it is important to FOLLOW THE WIRING HARNESS INSTALLATION INSTRUCTIONS CAREFULLY.

Make sure that the bike's battery and charging system are in good condition and the battery electrolyte levels are correct and the battery connections are clean and tight. The battery acts as an electrical 'buffer' and absorbs electrical spike energy and stabilises voltage in the electrical system.

CruiseSafe actuator cut off relay.

As an additional safety measure, MotorCycle Setup has developed a new component for use on motor cycle cruise controls, the CruiseSafe cut off relay.

The MotorCycle Setup 'CruiseSafe' actuator cut off cuts power to the cruise control throttle actuator (throttle servo) whenever the brake is applied. This innovative safety device is unique to the MCS product range and demonstrates the company's dedication to building product to the highest possible levels of safety, quality and reliability.

The 'CruiseSafe' cut off is a simple relay incorporated into the brake circuit so that when the brake light switch operates, power to the cruise control actuator is shut down.

WARNING: - In order to stop the motor cycle in the event of cruise control electrical malfunction, simply pull on the brakes. This will instantly remove power to the cruise control actuator.

WARNING: - In the event of a major malfunction, the cruise control may re-apply the throttle when the brakes are released. If this occurs, disconnect the loom computer plug from cruise control computer until the cause can be found and remedied.

WARNING: - Any erratic behaviour (cruise control disengages at random or it fails to engage without resetting by turning the cruise control power switch off and back on) from the cruise control should be regarded as suspicious. The cruise control computer should be disconnected until the cause can be found and remedied.

The 'CruiseSafe' protects you against accidental damage to the wiring loom or any sort of electrical failure or interference in the cruise control electronics causing a malfunction, because whenever the brakes are applied, the cruise control actuator is disconnected from power by the open relay.

Its operation is failsafe, which means that it if you lose power to the brakes, the brake light globes blow, a wire becomes disconnected or the 'CruiseSafe' relay fails, the power to the cruise control actuator is disconnected. The ONLY electrical failure it cannot protect against is if the brake light switch/s fail. Then you must turn the cruise control and the bike OFF using the bike's engine kill switch or ignition switch to kill the engine.

MotorCycle Setup has chosen to use a mechanical relay instead of an electronic device, because electrical interference cannot hinder its operation. Also, in the unlikely event of the relay failing, it is a standard automotive part used by major auto companies, and is readily available from auto electricians and auto spare parts outlets around the world. Fitting is simple. Just unplug the failed unit and plug the new one into the socket on the wiring loom.

There is no periodic maintenance required for the CruiseSafe relay. If the relay fails, simply undo the tape around the base of the relay and the relay socket, unplug the relay and replace with a new relay. We suggest that you re-tape the relay to the socket.

CAUTION: - The relay must be replaced with a relay of the same pin configuration and it must have a resistor suppressed coil. If a relay without a resistor suppressed coil is used, you will damage the cruise control computer. This will not be covered by warranty.

This relay is a common automotive relay and should be readily available from most automotive electrical outlets.

Other safety features.

The cruise control can be shut off by any of the following methods:

- **a.** Depressing either brake pedal/lever;
- **b.** Sliding the ON/OF switch to the OFF position;
- **c.** Decelerating to 75% of the set speed;
- **d.** Accelerating to 150% of the SET speed;
- **e.** Pulling in the clutch lever to trigger the ECS;
- **f.** Pressing the kill switch on the engine;
- **g.** Turning off the ignition key.

The cruise control will disengage if any of the connectors become separated, if the brake light filament breaks or the brake lights lose power - for example if a fuse blows.

There are numerous safety features designed into the computer and throttle actuator to ensure that should one or more components fail there is still a way to turn off your cruise control.

For safe and economical motoring NEVER operate this or any cruise control in:

- **congested or heavy traffic;**
- **on wet or slippery roads.**

WARNING: Your cruise control is designed with numerous safety features, but only the motorcycle KILL SWITCH or the IGNITION KEY can overcome a runaway condition caused by a tangled or jammed carburettor linkage. Double check your installation for ensure that the throttle linkage cannot jam.

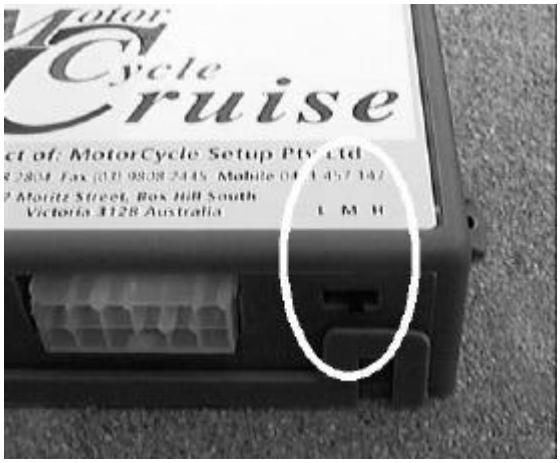
Regular inspection of control cables is recommended to prevent jamming of the throttle, which could occur if cables were frayed or damaged.

12. ROAD TEST AND ADJUSTMENTS

Your cruise control comes pre-adjusted from the factory and if installed properly should provide satisfactory performance on most bikes. To determine whether adjustment is necessary, perform the following road test:

1. Slide the ON/OFF switch to the on position;
2. Hold the SET key down and slowly accelerate the bike from 30kph to 50kph using the throttle. The cruise control should take over at about 40kph;
3. Depress one of the brake levers to turn the cruise control off;
4. Use the throttle to accelerate the bike up to 80kph and press the SET key. The cruise control should engage and smoothly maintain speed within 2kph;

- If the cruise control loses speed when engaged or is sluggish, increase the sensitivity adjustment by setting the sensitivity switch on the computer to the 'H' (High) position;
- If the cruise control gains speed when engaged or is erratic, decrease the sensitivity adjustment by setting the sensitivity switch on the computer to the 'L' (Low) position.
- MotorCycle Setup recommends you use the MEDIUM sensitivity switch position for high torque engines. These engines can produce rapid, unexpected and uncomfortable acceleration when controlled by the cruise control computer in high sensitivity mode.



Testing the electronic clutch switch.

The ECS may be road tested by setting the cruise on a suitable speed (ie. 60kph or 35 mph) while on a level road or slight uphill, and pulling in the clutch. The engine will rev higher initially but should drop quickly (within 1/2 second) back to idle. If this takes longer than this, check that there is no excess friction in the throttle mechanism that is slowing down the throttle and not allowing it to 'snap' shut.

The sensitivity of the switch is adjustable. The bottom of the box may be opened by releasing the two catches next to the wire entry hole. Beside the wire connection plug on the circuit board there is a black plastic 'jumper' block. This is a bridging connector to allow the two pins to be connected. This may be connected or disconnected from its pins to tailor the way the switch responds. Bridging the pins decreases the switches

sensitivity. This may be appropriate on fast revving sports engines. Disconnecting the pins increases the sensitivity. This is appropriate on slower revving touring engines. Try both settings to see what is suitable for your engine.

- The switch is supplied on the most sensitive setting with the jumper disconnected. The jumper is installed on one pin. The jumper may be removed, using a pair of long nose pliers, and then re-installed on both pins to decrease the sensitivity of the switch.

- If you cannot get the cruise to work at higher speeds jumper the pins to decrease sensitivity. If the switch takes too long to work, disconnect the pins to increase sensitivity.

- This completes the adjustment procedure.

13. TROUBLE SHOOTING, TESTING AND SELF-DIAGNOSTICS

See the attachment for detailed instructions.

WARNING: The computer, switch block and other components are water resistant - NOT WATERPROOF. When washing the bike avoid spraying or pouring water directly onto any component. It is recommended the switch be covered during washing.

The staff at MotorCycle Setup hopes you enjoy using your new cruise control and use it wisely and safely. Remember that cruise controls are not a licence to concentrate less while riding. We recommend you approach all other road users with greater care when using the cruise control and use substantially larger safety margins when riding in traffic. Its use in built-up areas is not recommended.

You will probably find using the cruise control a bit disconcerting at first until you get used to the throttle moving under your hand and the slight 'hunting' (acceleration and deceleration) of the bike downhill. It is not possible to eliminate the latter effect as the computer continuously attempts to balance its set speed with the road speed.

NOTE: Practice turning the cruise control off quickly so that you will be ready for any emergency. Experience suggests touching the footbrake is the best and quickest way to turn the cruise control off.

If by chance you are not holding the right handlebar when you need to make an emergency stop, the first reaction is to grab the front brake and clutch. In doing so, you may inadvertently hold the throttle open depending on how much throttle the cruise control had applied at the time. If this happened the engine revs would rapidly rise because the clutch was disengaged. You may think the cruise control is malfunctioning. Release your grip on the throttle and the bike should return to idle. The best way to avoid this occurrence is to practice rolling the throttle off whenever you use the front brake.

14. RIDING TIPS

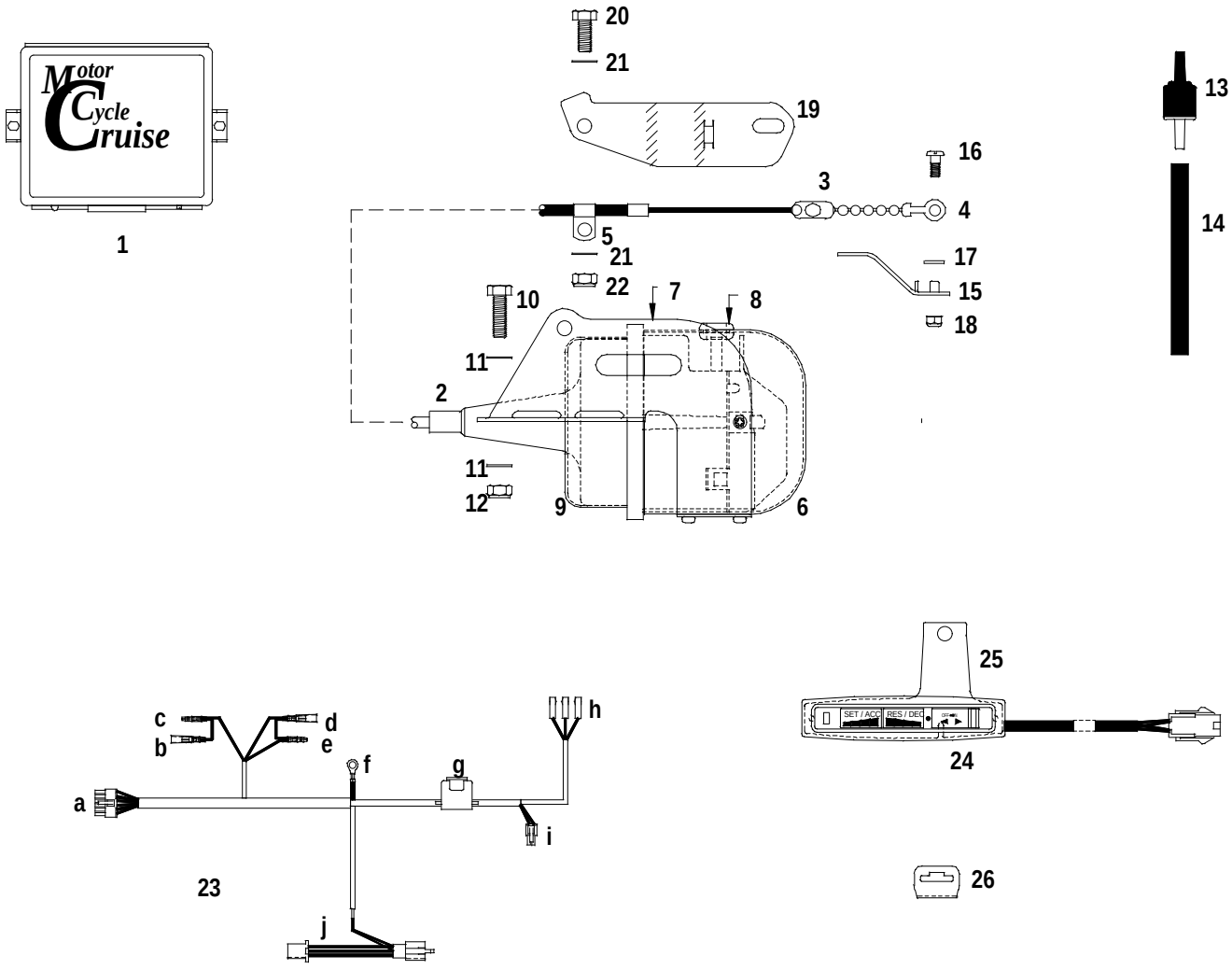
The cruise control engages most smoothly when the engine is under load. We recommend SETTING or RESUMING cruise operation while holding a constant speed. Maintain speed using the throttle: a) for a couple of seconds after pressing the SET key to allow time for the cruise control to take up cable free play; and b) until you feel the cruise take over after pressing RESUME.

HONDA VFR800

Packing list for MCS 1190 (~1999) and MCS 1180 (~2000) kit

Item	Qty	Part Number	Description
1.	1	MCS 12050L	Computer
		MCS 1194	**Vacuum actuator assembly**
2.	1	MCS 020	Vacuum actuator
3.	1	MCS 025C	Bead chain and coupling
4.	1	MCS 025B	5mm eye bead chain connector
5.	1	MCS 024A	3/16” cable clamp
6.	1	MCS 020D	Solenoid housing dust cover
7.	1	MCS 1194A	actuator bracket
	3		6g x 1/2” self tap screw
	1		6g x 3/8” self tap screw
8.	1	WG 5	Rubber grommet 3/8” x 1/2”
9.	1	MCS 020E	Diaphragm housing dust cover
10.	1		M6 x 25 plated bolt
11.	2		6mm plated flat washer
12.	1		M6 Nyloc nut
		MCS 1196	**Vacuum hose assembly**
13.	1	MCS 032	Vacuum stop valve
14.			4mm vacuum hose
		MCS 1191	**Carburettor arm assembly**
15.	1	MCS 1191A	Carburettor arm
16.	1	MCS 025A	4mm shouldered screw
17.	1		4mm flat washer
18.	1		M4 Nyloc nut
		MCS 1192	**Flexible cable bracket assembly**
19.	1	MCS 1192A	Actuator flexible cable bracket
20.	1		M6 x 15 plated bolt
21.	2		6mm plated flat washer
22.	1		M6 Nyloc nut
23.	1	**MCS 1193**	**Wiring loom for ~’99 bikes**
a			Computer plug (12 pin)
b			Brake sensor connector (green wire) Connect to the green wire with the yellow trace on the bikes loom
c			Brake sensor connector (brown and green wires) Connect to one of the black brake light switch wires
d			Brake sensor connector (brown and black wires) Connect to the other black brake light switch wire
e			Power connector (orange and black wires) Connect to the black wire with the brown trace on the bikes loom
f			Earth connector (green wire)
g			Fuse holder (3 amp fuse)
h			Actuator connectors (red, black, white wires)
i			Switch plug (4 pin)
j			Speed sensor connectors (pink, green, black wires)

	1	**MCS1183**	**Wiring loom for '00~ bikes**
		This loom is the same as above, but replaces the bullet connectors for the brake light switch with plastic housings. The loom is the same in all other respects	
		MCS 1195H	**Switch assembly**
24.	1	MCS 019	Control switch
25.	1	MCS 004AH	Switch bracket
	2		2g x 1/2" pan head self tap screw
26.	1	MCS 1197	Cable tie clip (for crankcase breather hose)
	1	MCS 1198	Warning label (attach to airbox near breather hose)
	10		100mm cable ties
	6		200mm cable ties
	4		300mm cable ties
	1	MCS 1190ECS	Electronic Clutch Switch
	1		Instructions
	1		Trouble shooting guide
	1		Warranty sheet



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MOTORCYCLE SETUP PTY. LTD.

12 MONTH CONSUMER SATISFACTION GUARANTEE REGISTRATION

Please keep this card and your receipt in a safe place. Copies of both are required if warranty service is needed.

Name:_____

Address:_____

_____

Telephone Number:_____

Item Model Number:_____MCS1190/1180_____ Date Purchased_____

Name of Retailer:_____

Installed By:_____

Year, Make and Model of Motor ycle:_____

I have read the warranty agreement below and accept its terms.

Customer signature:_____

Warranty service requires a copy of the sales receipt.

12 MONTH WARRANTY
MotorCycle Setup Pty. Ltd., 7 Moritz Street, Box Hill South, Victoria 3128, hereby warrant that it will repair or replace to the original purchaser products which prove to be defective under normal use and service in workmanship or material.

MotorCycle Setup obligation under this warranty is limited to the repair or replacement of the product at its option without charge for parts and labour at its warehouse located at the above address at Box Hill, when the product is returned with postal charges prepaid and examination of the product shall disclose it not to have been defective in the respects aforesaid during the warranty period.

The repairs or replacements will be made promptly and the repaired unit will be returned with all postal charges prepaid.

Coverage under this warranty is limited to the original purchase of the product at retail. When requesting warranty service a copy of the sales receipt or guarantee card must be submitted.

The warranty period for cruise controls is limited to a period of 12 months from the date of purchase. No warranty is implied for the installation and therefore MotorCycle Setup will not be responsible for installation or re-installation charges.

Warranty does NOT apply to electrical globes and perishable rubber products.

This warranty does not apply to products or equipment or components used in conjunction with the cruise control.

Warranty doe not cover unauthorised repairs, improper installation or application, damage or misuse or product which has not been maintained or used in accordance with the operating specifications as set forth in the written instructions.

The warranty term shall not extend beyond its original term with respect to subsequent warranty replacement.

Under no circumstances shall MotorCycle Setup be liable for consequential damages or breach of this warranty or for any implied warranty.

MotorCycle Setup neither assumes nor authorizes any person to assume for it or any obligation or liability other than herein expressly stated.

MOTORCYCLE SETUP CUSTOMER SERVICE POLICY

You will receive free consultation on any problem you might encounter in the assembly or use of MotorCycle Setup products. Just drop us a note, email us at **mcsetup@bigpond.net.au** or give us a call on **+61 3 9808 2804.**

You can obtain parts directly from MotorCycle Setup by writing to us or from your dealer. Use your packing list to describe your requirements.

If you are not satisfied with our service or with our products, write direct to the Managing Director, MotorCycle Setup Pty. Ltd., 7 Moritz Street, Box Hill, Victoria, Australia, 3128. He will make certain your problem receives immediate personal attention.

The benefits conferred by this guarantee are in addition to all other rights and remedies in respect of the product, which the consumer has under the Trade Practices Act, and other State and Territory Laws.

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